Fundamentos de Estadistica MCPI
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1. Calcula el coeficiente de Pearson, Media Cuartílica y la medida de Fisher para la siguiente distribución.
2. Calcular también el tipo de curtosis.

IQ score	# students	C.F.	Mid Value	F(X)	F(X^2)
50-60	5	5	55	275	15125
60-70	8	13	65	520	33800
70-80	10	23	75	750	56250
80-90	18	41	85	1530	130050
90-100	25	66	95	2375	225625
100-110	21	87	105	2205	231525
110-120	19	106	115	2185	251275
120-130	10	116	125	1250	156250
130-140	4	120	135	540	72900
Total	120			11630	1172800

$$Mean(\bar{x}) = \frac{\Sigma fX}{n} = \frac{11630}{120} = 96.9$$

$$Variance = \frac{\Sigma fX^2}{N} - \left(\frac{\Sigma fx}{N}\right)^2 = \frac{1172800}{120} - (96.92)^2 = 380.49$$

$$Standard\ deviation = \sqrt{variance} = \sqrt{380.49} = 19.50$$

$$First\ Quartiles = Q_1 = L + \frac{\frac{N}{4} - c.f.}{f} \times h = 80 + (30 - 23) \times \frac{10}{18} = 83.89$$

$$Second\ Quartiles = Q_1 = L + \frac{\frac{N}{2} - c.f.}{f} \times h = 90 + (60 - 41) \times \frac{10}{25} = 97.60$$

$$Third\ Quartiles = Q_3 = L + \frac{\frac{3N}{4} - c.f.}{f} \times h = 100 + (90 - 18) \times \frac{10}{19} = 111.58$$

Also,

$$Mode = M_0 = L + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \times h = 90 + \frac{10 - (25 - 18)}{2 \times 25 - 18 - 21} = 96.36$$

Hence,

S_k(Based on median) = mean – median = 96.92-97.60=-0.68

S_k(Based on mode) = mean – mode = 96.92 – 96.36 = 0.56

S_k(Based on quartiles) = $(Q_3 - Q_2) - (Q_2 - Q_1)$=(111.58-97.60)-(97.6-83.89)=0.27

$$S_k(Karl\ Pearson) = \frac{Mean - Mode}{\sigma} = \frac{96.92 - 06.36}{19.50} = 0.029$$

$$S_k(Bowley) = \frac{Q_3 + Q_1 - 2M_d}{Q_3 - Q_1} = \frac{(111.58 + 83.89) - 2 \times 97.2}{11.58 - 83.89} = 0.039$$

Medida de Fisher (Curtosis):

Se requiere el tercer momento central, $\sum f(x - \bar{x})^3 \approx -28951.84$.

$$g_1 = \frac{\sum f(x - \bar{x})^3 / n}{s^3} = \frac{-28951.84/120}{(19.57)^3} \approx \mathbf{-0.032}$$

- Si $\alpha_4 < 3$: Platicúrtica
- Si $\alpha_4 = 3$: Mesocúrtica (Normal)
- Si $\alpha_4 > 3$: Leptocúrtica

Conclusión: Dado que $2.3095 < 3$, la distribución es **Platicúrtica**.